



1 June 2006

## CRUISE RESULTS

NOAA Ship ALBATROSS IV  
Cruise No. AL 06-03 Parts (I-III)  
Spring Bottom Trawl Survey

### CRUISE PERIOD AND AREA

The cruise period was from 7 March to 21 April 2006. The cruise was conducted in four parts: Part I was from 7 – 23 March; Part II, 27 March – 7 April; Part III, 11 – 21 April. The area of operations was from Cape Hatteras to the western Scotian Shelf, including the Gulf of Maine. Station locations are shown in Figures 1 and 2.

### OBJECTIVES

The objectives of the cruise were to: (1) determine the seasonal distribution, relative abundance, and biodiversity of fish and invertebrate species found on the continental shelf; (2) collect biological samples for age determinations and growth studies, fecundity, maturity and feeding ecology; (3) collect hydrographic and meteorological data; (4) collect samples of ichthyoplankton and zooplankton for relative abundance and distribution studies; (5) collect data and samples for cooperative researchers and programs; and (6) conduct a hydroacoustic survey between stations.

### METHODS

Operations and gear used during Parts I-III conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 13 February 2006 and Addendum 1 dated 2 March 2006; Addendum 2 dated 22 March 2006; Addendum 3 dated 6 April 2006; with the following exceptions: Leg 1 left 1 day late due to mechanical problems and returned one day early due to station location at end of the leg. Leg 3 left one day late due to ship drills and returned one day early upon finishing all the stations. Because Leg 3 completed the survey, Leg 4 was cancelled and the cruise ended early.

A 30-minute tow was made at each station with a Northeast Fisheries Science Center (NEFSC) standardized number 36 Yankee otter trawl rigged with 41 centimeter (cm) diameter rubber rollers, 36 floats, and 9 meter (m) bridles. NEFSC standardized 450 kilogram (kg) polyvalent trawl doors rigged with chain backstraps were used. The trawl was fished at a scope of 4:1 in depths between 18 and 27 m, 3:1 in depths between 28 and 183 m deep, and 2.5:1 in depths of 184 m and greater. Towing speed was maintained at approximately 3.8 knots using DGPS instrumentation. Direction of the tow was generally toward the next station. Throughout the cruise, a hydroacoustic survey was conducted during transit between bottom trawl stations using the Simrad EK-500 system.

After each tow, the catch was sorted by species and weighed to the nearest 0.001 kg using motion-compensated digital scales. Representative length frequencies were collected for all species caught. All catch and biological data were recorded using shipboard automated data entry systems. The Fisheries Scientific Computing System (FSCS) was used to record all biological data. This system uses digital scales, electronic measuring boards, touch screen displays and barcode scanners to record data on deck and archives the data on the ship's computer network.

Sampled fish were assigned individual identification numbers, measured, weighed to the nearest 0.001 kilogram, and further sampled for age and growth and feeding ecology studies. Bony fish were measured to the nearest centimeter to the end of the central caudal ray; biological samples were collected concurrently with measuring operations. Sharks and skates were measured to the end of the caudal fin (total length). Rays were measured for disk width. Lobsters were measured in millimeters from the posterior edge of the eye socket to the end of the carapace; the presence or absence of a V-notch was also noted. Crabs were measured across the carapace width in centimeters. Shell height was measured in centimeters for selected bivalves. Additional collections were obtained for various scientists (Table 2). The remainder of the catch (miscellaneous invertebrates, shells, substrate, etc) was described by volume.

Surface temperatures were measured using the hull-mounted temperature sensor at a depth of 3 meters. Temperature and conductivity profiles were recorded using a conductivity, temperature, and depth (CTD) instrument at every station. A bottom salinity sample was obtained twice each day to calibrate the CTD. Water samples were also taken for fluorometer calibrations.

Samples of fish eggs and larvae were collected at selected stations. Plankton sampling gear consisted of a 61 cm bongo frame fitted with 0.333 mm mesh nets. Digital flow meters were suspended within the mouths of the bongo frame to estimate water volume filtered. The net was towed at 2.8-3.8 kilometers/hour (1.5-2.0 knots). A CTD was deployed at each plankton station.

## RESULTS

The survey sampled at 344 stations with 174, 100, and 70 stations completed on parts I-III, respectively.

Standard plankton tows were made at 119 stations. Bottom temperatures were collected at all stations using the CTD system. Bottom water samples for CTD calibration were taken at 63 stations.

Tables 1 and 2 list the major samples collected for various studies.

### DISPOSITION OF SAMPLES AND DATA

Age and growth samples, feeding ecology data and samples, maturity data, trawl catch data, and hydrographic data will be analyzed at the NEFSC Woods Hole, Massachusetts Laboratory. The various collections were forwarded to the individuals listed in Table 2. Resulting data will be audited, edited, and entered into the NEFSC trawl survey database.

### SCIENTIFIC PERSONNEL

#### National Marine Fisheries Service, NEFSC, Woods Hole, MA

Larry Brady<sup>2</sup>, Chief Scientist<sup>3</sup>

Peter Chase, Chief Scientist<sup>1</sup>

Stacy Rowe, Chief Scientist<sup>2</sup>

Elisabeth Broughton<sup>3</sup>

William Duffy<sup>1</sup>

Jonathan Duquette<sup>1,3</sup>

Robert Johnston<sup>2</sup>

Charles Keith<sup>2</sup>

Nathan Keith<sup>3</sup>

Sean Lucey<sup>3</sup>

Kevin McIntosh<sup>2,3</sup>

Paul Nitschke<sup>2</sup>

Yvonna Rowinski<sup>1</sup>

Brian Smith<sup>2</sup>

#### National Marine Fisheries Service, NEFSC, Sandy Hook, NJ

John Rosendale<sup>1</sup>

John Sibunka<sup>3</sup>

#### National Marine Fisheries Service, NEFSC, Washington, DC

La'Shaun Willis<sup>2</sup>

#### National Marine Fisheries Service, NERO, Gloucester, MA

Kevin Chu<sup>1</sup>

Brian Hooker<sup>3</sup>

#### University of Massachusetts, Amherst, MA

Joseph Kunkel<sup>3</sup>

Contractors

Tim Bertrand <sup>3</sup>	Integrated Statistics, Woods Hole, MA
Laurel Col <sup>2</sup>	Integrated Statistics, Woods Hole, MA
Wesley Dukes <sup>2</sup>	Integrated Statistics, Woods Hole, MA
Jakub Kircun <sup>1,3</sup>	Integrated Statistics, Woods Hole, MA
Nikolai Klibansky <sup>1</sup>	Independent Contractor, Northampton, MA
Katey Marsik <sup>2</sup>	Integrated Statistics, Narragansett, RI
Lonna Perry <sup>1</sup>	Integrated Statistics, Steuben, ME
Peter Plantamura <sup>1</sup>	End to End Tech. Services, Sandy Hook, NJ
Mario Travaline <sup>3</sup>	Integrated Statistics, Woods Hole, MA

Volunteers

Heath Cook <sup>1</sup>	Kingsford, Australia
Emily Klein <sup>2</sup>	Portsmouth, NH
Michael Marsik <sup>1,2</sup>	Honolulu, HI
Mary Radlinski <sup>2</sup>	New Bedford, MA
Brian Will <sup>1</sup>	Flushing, NY

<sup>1</sup>7 – 23 March

<sup>2</sup>27 March – 7 April

<sup>3</sup>11 – 21 April

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For further information, contact: Russell Brown, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Phone (508) 495-2380; FAX (508) 495-2258; [Russell.Brown@noaa.gov](mailto:Russell.Brown@noaa.gov). The Resource Survey Report for this survey can be viewed at [http://www.nefsc.noaa.gov/esb/Resource\\_Survey\\_Reports.htm](http://www.nefsc.noaa.gov/esb/Resource_Survey_Reports.htm) and the cruise results can be viewed at <http://www.nefsc.noaa.gov/esb/survey.htm>.

Table 1. Field observations and samples collected for feeding ecology, and age and growth studies on the NOAA Ship ALBATROSS IV, Cruise 06-03 (I-III), Spring Bottom Trawl Survey, during 7 March to 21 April 2006.

<b>Species</b>	<b>Feeding Ecology Observations</b>	<b>Age and Growth Samples</b>
Acadian Redfish	147	378
American Plaice	290	720
American Shad	88	-
Atlantic Cod	171	423
Atlantic Croaker	8	40
Atlantic Halibut	25	26
Atlantic Herring	288	1055
Atlantic Mackerel	170	386
Atlantic Menhaden	4	-
Atlantic Wolffish	3	3
Barndoor Skate	36	-
Black Sea Bass	34	71
Blackbelly Rosefish	40	-
Blueback Herring	139	-
Bluefish	13	18
Buckler Dory	2	-
Butterfish	114	292
Clearnose Skate	27	-
Cunner	6	-
Cusk	10	10
Fawn Cusk-eel	49	-
Fourbeard Rockling	21	-
Fourspot Flounder	137	187
Goosefish	50	61
Gulf Stream Flounder	62	-
Haddock	287	646
Lanternfish Uncl		-
Little Skate	226	-
Longhorn Sculpin	243	-
Northern Kingfish	3	-
Northern Searobin	41	3
Ocean Pout	87	86
Offshore Hake	4	4
Pollock	60	139
Red Hake	329	364
Rosette Skate	7	-
Scup	33	73
Sea Raven	181	-
Silver Hake	390	883
Smooth Dogfish	33	-
Smooth Skate	39	-
Spiny Dogfish	452	1114
Spot	17	-
Spotted Hake	136	206
Striped Bass	57	57
Striped Searobin	4	-
Summer Flounder	119	220

<b>Species</b>	<b>Feeding Ecology Observations</b>	<b>Age and Growth Samples</b>
Thorny Skate	20	-
Weakfish	15	26
White Hake	100	200
Windowpane	153	179
Winter Flounder	265	520
Witch Flounder	177	223
Winter Skate	121	-
Yellowtail Flounder	170	357
Total	5703	8970

Table 2. Miscellaneous scientific collections made on NOAA Ship ALBATROSS IV, Cruise 06-03 (I-III), Spring Bottom Trawl Survey, during 7 March to 21 April 2006.

Investigator and Affiliation	Samples Saved	Approximate Number
Katie Anderson, Univ. of Massachusetts, Amherst, MA	Haddock	16 samples
Aquarium, NMFS, NEFSC, Woods Hole, MA	Atlantic herring	15 bags
	Illex squid	1 bag
	Shrimp	58 bags
	Sea raven	2 indiv.
	Wrymouth	1 indiv.
Jon Brodziak, NMFS, NEFSC, Woods Hole, MA	Haddock	44 samples
Karen Bolles, NMFS, NEFSC, Woods Hole, MA	Atlantic herring	493 indiv.
Peter Chase, NMFS, NEFSC, Woods Hole, MA	Various species, maturity workshop	112 indiv.
	Various species, fish ID project	98 indiv.
Stephen Clifford, Dalhousie University, Nova Scotia	Various species	5 indiv.
Buck Denton, NMFS, NEFSC, Woods Hole, MA	Various species	344 indiv.
Michael Frisk, SUNY, Stony Brook, NY	Live skates	10 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Misc. species	836 indiv.
Heather Haas, NMFS, NEFSC, Woods Hole, MA	Turtles	2 exam.
Jonathan Hare, NMFS, NEFSC, Narragansett, RI	Alewife	137 indiv.
	Blueback herring	33 indiv.
Diane Kapareiko, NMFS, NEFSC, Milford, CT	American lobster	6 indiv.
Josef Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	105 bags
Francis Juanes, UMASS, Amherst, MA	Silver hake	49 indiv.
	Offshore hake	4 indiv.
Charles Keith, NMFS, NEFSC, Woods Hole, MA	Atlantic hagfish	12 indiv.
Kerney, Ryan, Harvard Museum of Comparative Zoology, MA	Atlantic hagfish	6 indiv.
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	Various sharks, tagging	3 indiv.
Joseph Kunkel, Univ. of Massachusetts, Amherst, MA	Haddock	1 indiv.
	Bluefish	1 indiv.
	Acadian redfish	1 indiv.
Jason Link & Brian Smith, NMFS, NEFSC, Woods Hole, MA	Preserved stomachs	224 samples
Sean Lucey, NMFS, NEFSC, Woods Hole, MA	Various species	19 samples
William Overholtz, NMFS, NEFSC, Woods Hole, MA	Various species	5 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	Various species	471 indiv.
Kevin McIntosh, NMFS, NEFSC, Woods Hole, MA	Wrymouth	1 indiv.
Thomas Munroe, NMFS, NEFSC, Nat. Systematics Lab, Washington, DC	Various flatfish	36 indiv.
Paul Nitschke, NMFS, NEFSC, Woods Hole, MA	Winter flounder	35 indiv.
Martha Nizinski, NMFS, NEFSC, Nat. Systematics Lab, Washington, DC	Galatheid crab	46 indiv.
Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA	Various skates	510 exam.
	Various skate vertebrae	166 indiv.
	Various rays	63 exam.
	Spiny dogfish	511 exam.
John Ziskowski, NMFS, NEFSC, Milford, CT	American plaice	327 indiv.

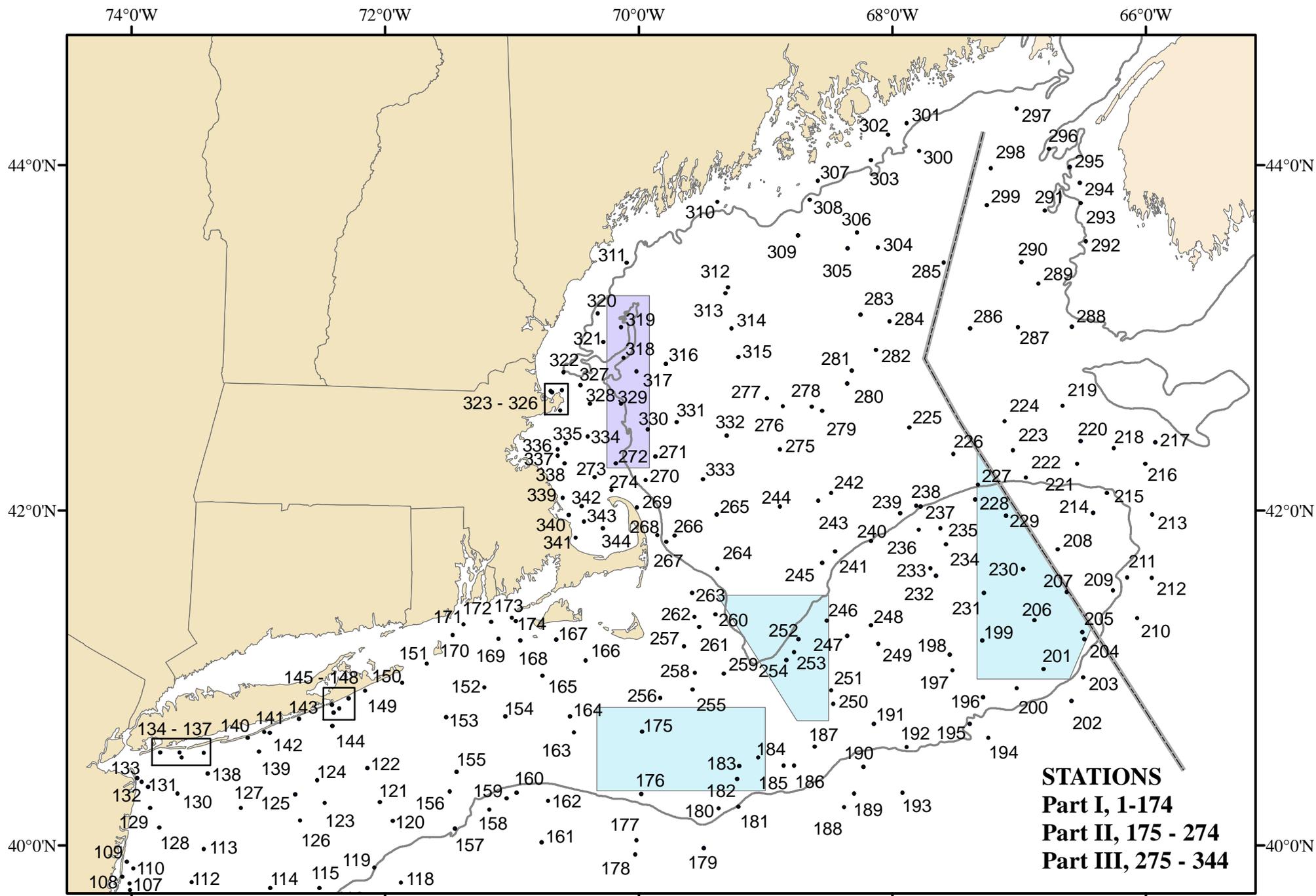


Figure 2. Trawl hauls made from NOAA Ship ALBATROSS IV (06 - 03), during NOAA Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, March 7 - April 20, 2006.

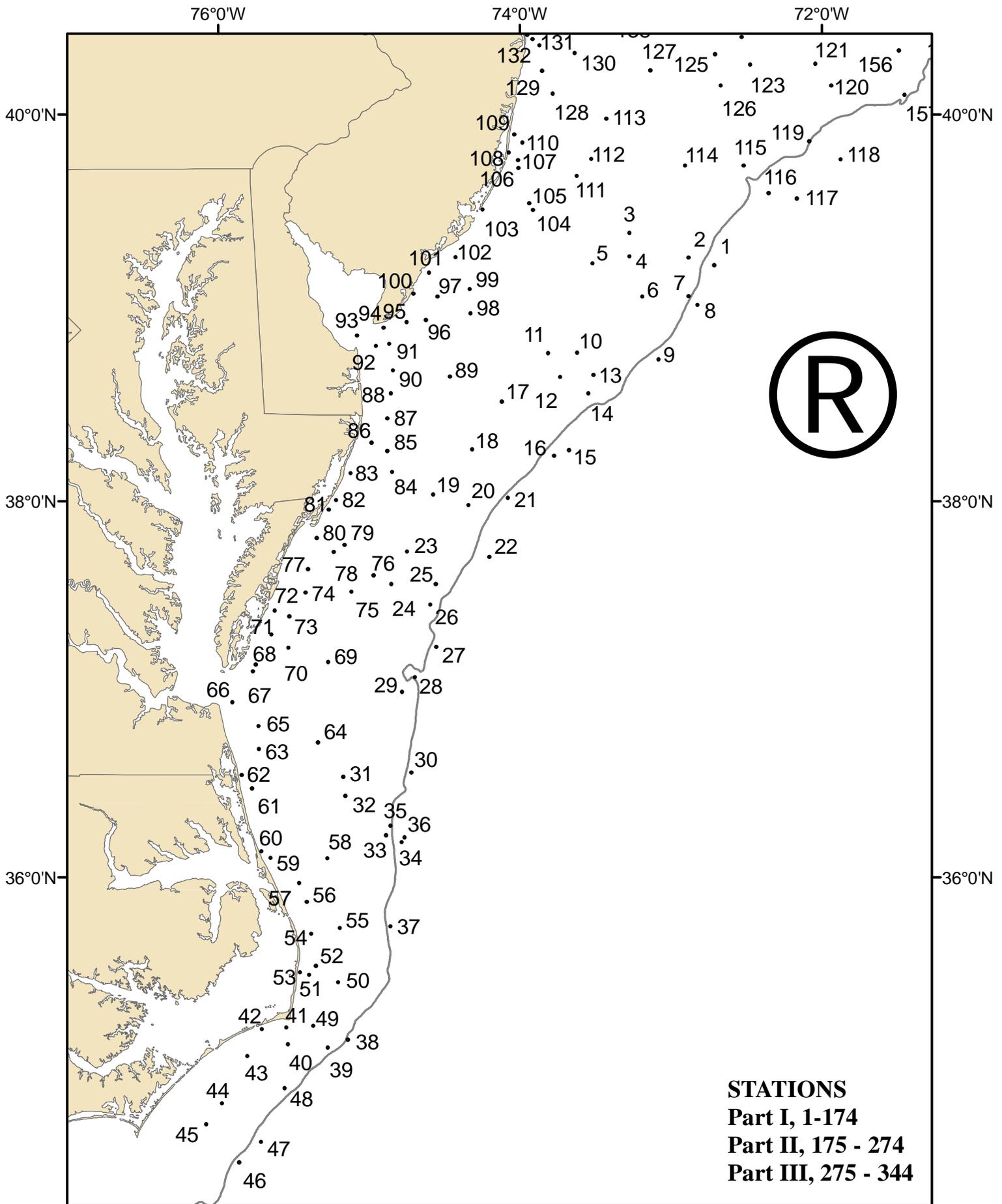


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